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## NOTICE OF ALLOWANCE AND FEE(S) DUE

22801 7590 03/27/2009

LEE & HAYES, PLLC  
601 W. RIVERSIDE AVENUE  
SUITE 1400  
SPOKANE, WA 99201

EXAMINER

DEBNATH, SUMAN

ART UNIT

PAPER NUMBER

2435

DATE MAILED: 03/27/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/802,981

03/17/2004

Darko Kirovski

MS1-1934US

3895

TITLE OF INVENTION: SYSTEMS AND METHODS FOR ENCODING RANDOMLY DISTRIBUTED FEATURES IN AN OBJECT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	06/29/2009

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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22801 7590 03/27/2009

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## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/802,981 03/17/2004 Darko Kirovski MS1-1934US 3895

TITLE OF INVENTION: SYSTEMS AND METHODS FOR ENCODING RANDOMLY DISTRIBUTED FEATURES IN AN OBJECT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1510 \$300 \$0 \$1810 06/29/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
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DEBNATH, SUMAN 2435 713-176000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/802,981	03/17/2004	Darko Kirovski	MS1-1934US	3895
22801	7590	03/27/2009	EXAMINER	
LEE & HAYES, PLLC 601 W. RIVERSIDE AVENUE SUITE 1400 SPOKANE, WA 99201			DEBNATH, SUMAN	
			ART UNIT	PAPER NUMBER
			2435	
DATE MAILED: 03/27/2009				

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 752 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 752 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/802,981	KIROVSKI, DARKO	
	<b>Examiner</b>	<b>Art Unit</b>	
	SUMAN DEBNATH	2435	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/30/2008.
2. ☒ The allowed claim(s) is/are 1,3-15,17-22 and 24-32.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date ____     | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input type="checkbox"/> Other ____.   |

### **DETAILED ACTION**

1. Claims 1, 3-15, 17-22, 24-32 are pending in this application.

### **EXAMINER'S AMENDMENT**

2. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David S. Thompson on (Reg. No. 37,954) on December 2<sup>nd</sup>, 2008.

The application has been amended as follows:

#### **In the Claims:**

1. (Currently Amended) A method comprising:  
determining randomly distributed features in an object;  
determining a probability density function associated with the object;  
compressing data representing the randomly distributed features, wherein the compressing is based in part on the probability density function;  
encoding the compressed data with a signature; and  
creating a label comprising the object and the encoded ~~data~~: data;

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determining vectors associated with the randomly distributed features based, at least in part, on the probability density function; and  
encoding the vectors using an arithmetic coding algorithm, wherein the algorithm comprises:

set  $U$  as a list of all unit areas in  $S - S_i - u$   
list of all marked units,  $M(u)$ , is set to  $M(u) = \emptyset$   
do  
find all unit areas  $V = \operatorname{argmin}_{v \in U} \|Q_v - Q_u\|$   
do  
find unit area  $w = \operatorname{argmax}_{v \in V} \xi(1, v)$   
set AC range for  $w$  to  $\gamma(w, u)$   
set of nodes ordered before  $w$  is  $M_w(u) = M(u)$   
 $M(u) = M(u) \cup w$ ,  $V = V - w$ ,  $U = U - w$   
while  $V \neq \emptyset$   
while  $U \neq \emptyset$

2. (Cancelled)

3. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, wherein encoding the vectors using the arithmetic coding algorithm includes determining a path for connecting a portion of the vectors within a fixed amount of data.

4. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, wherein the randomly distributed features are fibers that are randomly positioned in the object.

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8. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, wherein the data is encoded with a private key.

9. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, wherein the label is a certificate of authenticity configured to be self-authenticated and wherein the object is an authentication object included in the certificate of authenticity.

10. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, wherein the encoded data is included in the label as a barcode.

11. (Currently Amended) The method as recited in ~~Claim 2~~ Claim 1, further comprising:

- determining textual data that includes a string of characters;
- hashing the textual data with an algorithm;
- encrypting the compressed data using the hashed textual data; and
- including the textual data in the label.

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15. (Currently Amended) A system comprising

an issuer configured to determine randomly distributed features in an authentication object and to compress data representing the randomly distributed features comprising fibers, the issuer being further configured to encode the compressed data with a signature and to create a label that includes the authentication object and the encoded data;

wherein the issuer is further configured to determine a probability density function associated with the authentication object, wherein the probability density function is defined as the likelihood of finding a second end of a fiber at a given location within a non-illuminated area when a first end of the fiber is located within an illuminated area of the authentication object, to determine vectors associated with the randomly distributed attributes based, at least in part, on the probability density function, and to encode a portion of the vectors as a path by applying an arithmetic coding ~~algorithm~~; algorithm, wherein the algorithm comprises:

set  $U$  as a list of all unit areas in  $S - S_i - u$   
list of all marked units,  $M(u)$ , is set to  $M(u) = \emptyset$   
do  
find all unit areas  $V = \operatorname{argmin}_{v \in U} \|Q_v - Q_u\|$   
do  
find unit area  $w = \operatorname{argmax}_{v \in V} \xi(1, v)$   
set AC range for  $w$  to  $\gamma(w, u)$   
set of nodes ordered before  $w$  is  $M_w(u) = M(u)$   
 $M(u) = M(u) \cup w$ ,  $V = V - w$ ,  $U = U - w$   
while  $V \neq \emptyset$   
while  $U \neq \emptyset$



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28. (Currently Amended) An apparatus comprising:

means for determining randomly distributed features in an authentication object;

means for determining a probability density function associated with the authentication object, wherein the probability density function defines a likelihood a point will contain an illuminated second end of a fiber and is conditioned on location of a first end of the fiber in an illuminated region;

means for compressing data representing the randomly distributed features, wherein the compressing is based in part on the probability density function;

means for encoding the data with a signature; and

means for creating a label that includes the authentication object and the encoded data.

means for determining vectors associated with the randomly distributed features based, at least in part, on the probability density function; and

means for encoding the vectors using an arithmetic coding algorithm, wherein the algorithm comprises:

set  $U$  as a list of all unit areas in  $S - S_i - u$  .  
list of all marked units,  $M(u)$  , is set to  $M(u) = \emptyset$  .  
do  
find all unit areas  $V = \operatorname{argmin}_{v \in U} \|Q_v - Q_u\|$  .  
do  
find unit area  $w = \operatorname{argmax}_{v \in V} \xi(1, v)$  .  
set AC range for  $w$  to  $\gamma(w, u)$  (see Eqns.17,18).  
set of nodes ordered before  $w$  is  $M_w(u) = M(u)$  .  
 $M(u) = M(u) \cup w$  ,  $V = V - w$  ,  $U = U - w$  .  
while  $V \neq \emptyset$  .  
while  $U \neq \emptyset$  .

***Allowable Subject Matter***

3. Claims 1, 3-15, 17-22, 24-32 are allowed.

**Examiner's Statement of Reasons for Allowance:**

The following is an Examiner's statement of reasons for allowance: Independent claims 1, 15, 22 and 28 recite the uniquely distinct feature of "...determining randomly distributed features in an object; determining a probability density function associated with the object; compressing data representing the randomly distributed features, wherein the compressing is based in part on the probability density function; encoding the compressed data with a signature; and creating a label comprising the object and the encoded data; determining vectors associated with the randomly distributed features based, at least in part, on the probability density function; and encoding the vectors using an arithmetic coding algorithm, wherein the algorithm comprises:

```
set  $U$  as a list of all unit areas in  $S - S_i - u$ 
list of all marked units,  $M(u)$ , is set to  $M(u) = \emptyset$ 
do
  find all unit areas  $V = \operatorname{argmin}_{v \in U} \|Q_v - Q_u\|$ 
  do
    find unit area  $w = \operatorname{argmax}_{v \in V} \xi(1, v)$ 
    set AC range for  $w$  to  $\gamma(w, u)$ 
    set of nodes ordered before  $w$  is  $M_w(u) = M(u)$ 
     $M(u) = M(u) \cup w$ ,  $V = V - w$ ,  $U = U - w$ 
  while  $V \neq \emptyset$ 
while  $U \neq \emptyset$  ."
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The prior art, taken either singly or in combination, fails to anticipate or fairly suggest the limitations of Applicant's independent claims, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The claimed invention is therefore considered to be in condition for allowance as being novel and nonobviousness over prior art.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUMAN DEBNATH whose telephone number is (571)270-1256. The examiner can normally be reached on 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y. Vu can be reached on 571 272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. D./

Examiner, Art Unit 2435

/Kimyen Vu/

Supervisory Patent Examiner, Art Unit 2435